2A94-24

PRINCE WILLIAM SOUND MANAGEMENT AREA
1993 SHELLFISH ANNUAL MANAGEMENT REPORT

REGIONAL INFORMATIONAL REPORT[1] NO. 2A94-24

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333 Raspberry Road
Anchorage, Alaska 99581

June 1994

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INTRODUCTION

This report documents the most recently completed shellfish fisheries in the Prince William Sound Management Area (Area E) which is comprised of all waters of Prince William Sound and the Gulf of Alaska from Cape Suckling to the east and Cape Fairfield to the west. The fisheries are: 1993-94 sidestripe shrimp *Pandalopsis dispar* trawl fishery, 1993 weathervane scallop *Patinopecten caurinus* dredge fishery, and the 1993 razor clam *Siliqua patula* fishery. Octopus and squid harvested as bycatch in groundfish fisheries are also reported.

The following fisheries are also reviewed in this report although the 1993 - 1994 commercial seasons were not opened. The 1994 Tanner crab *Chionoecetes bairdi* and the 1993-94 king crab fisheries remained closed due to low stock abundance. The 1993 Dungeness crab *Cancer magister* and spot shrimp *Pandalus platyceros* fisheries were also closed due to low stock abundance and poor recruitment.

Shellfish landings from directed fisheries in Area E during the past year included 246,190 pounds of trawl shrimp and 63,068 pounds of weathervane scallops. Harvest data from the razor clam fishery are confidential. A department policy on confidentiality states that any time a fishery or statistical area has fewer than three participants, catch information may not be made public. Table 1 lists Emergency Orders affecting area fisheries during 1993.

The estimated ex-vessel value by fishery was $502,000 for trawl shrimp and $282,000 for weathervane scallops.

TANNER CRAB FISHERY

Introduction

The Prince William Sound Management Area Tanner crabs have historically been the primary shellfish resource in terms of landed weight. Over 74 million pounds have been harvested during the past 26 years. Historically, the harvest has been approximately equally divided between the Gulf of Alaska and Prince William Sound (PWS).

The management area is divided into four Tanner crab management districts (Figure 1). The Northern and Hinchinbrook Districts include most of the waters inside PWS proper while the Eastern and Western Districts encompass the Gulf of Alaska portion of the management area and southwestern PWS.

The Tanner crab fishery in PWS is classified as "superexclusive". This term means that a boat validly registered to fish in the PWS registration area may not participate in any other Tanner crab fishery within the state during that registration year. Conversely, a boat validly registered to fish in another registration area may not fish in PWS during that registration year. Other regulations unique to the fishery are a 175-pot limit in Area waters west of 146°40' West longitude. East of this line a 100-pot limit is in effect. The minimum legal size limit for Tanner crab in Area E is 135mm (5.3 in). The fishery regulatory season dates are January 15 - March 31.

Tanner crab fishing began in 1968 when 1.2 million pounds were landed. The fishery peaked at 13.9 million pounds in the 1972-73 season prior to implementation of the minimum legal size in 1976. The area experienced decreasing harvests during the late 70's and early 80's. These decreasing harvests preceded large area closures during the 1984 and 1985 seasons and subsequently full area closures from 1988 to 1993 (Appendix A).

There are three reasonable explanations for the decline in abundance of the Prince William Sound Tanner crab stock:

1) The overharvest of immature and mature males and the harvest of females prior to the adoption of the minimum size limit of 5.3 inches in 1976. For example in 1974, 3.8 million pounds were harvested of which 2.7 million pounds were below the current minimum size limit.

2) Lengthy seasons also had significant adverse effects on the stocks due to excessive trapping, handling, and lost gear. Seasons from 1974 through 1981 lasted seven months.

3) Unfavorable environmental conditions: warming ocean temperatures may be a contributing factor to the sharp decline and continued low abundance of Tanner crabs in the management area by favoring the production of predators and providing suboptimal environmental conditions for survival of crab larvae.

Following the significant decline in catch from 1979 - 1984 the desire to harvest a buildup of postrecruit crabs prompted a reopening of the Tanner crab fishery beginning in 1986. Harvests from 1986 - 1988 averaged 0.52 million pounds. The department's 1988 annual survey indicated a decline in the Tanner stock. Both recruit and prerecruit abundance declined to historic survey lows. Coincident with the decline in survey catch was a decrease in the stock's geographic distribution. This information prompted the department to close the 1989 Tanner crab fishery. The fishery has remained closed through the 1993 season due to continued low stock abundance.

In 1990, the department initiated a trawl sampling program for Tanner crab to determine whether it was a feasible sampling tool for the waters of Prince William Sound. In 1991 the trawl survey was extended to provide coverage of all traditional Tanner index pot survey

stations. The pot survey was also continued during these years to provide a basis for comparison between survey techniques.

Results of the 1991 trawl survey indicated that the numbers of true recruit and legal sized crabs was low with estimates of 20,300 and 105,045 respectively. These figures were supported by the pot survey which yielded an index of 0.1 true recruit and 3.4 legal crabs per pot. Both of these numbers are historic lows for the pot survey which has been ongoing since 1977.

One of the benefits derived from adopting a trawl survey is the ability of trawl gear to sample younger age classes of crab. Trawl gear allows the tracking of these age classes while the pot gear is incapable of capturing and holding crab at these ages because of the large mesh size. This ability provides an indication of upcoming year class strength. For example, the 1991 trawl survey showed a relatively strong prerecruit-3 age class. The growth of this age class can be seen in the shift to the right in the 1992 survey length frequency (Figure 2).

Sampling for the occurrence of bitter crab dinoflagellate disease syndrome was accomplished in 1990 and 1991. Bitter crab disease is characterized by poor meat quality, a pink carapace and milky hemolymph. According to department staff in Southeast Alaska, the disease results in 100% mortality of infected crabs. In 1990, 6 of 83 (7%) hemolymph samples submitted to the Alaska Department of Fish & Game Fish Pathology Laboratory in Juneau tested positive. Of the six positive crab samples, four were from oldshell crabs. None of the 79 hemolymph samples submitted in 1991 tested positive. No samples were collected in 1992.

1994 Season Summary

The commercial Tanner crab fishery in the PWS management area remained closed in 1994. Tanner crab in PWS remain in a depressed condition. The 1993 trawl survey indicated decreases in both the male and female stock components. The greatest drops were seen in the prerecruit 2 and 3 males and in adult females. Despite the decrease in overall numbers of males

the estimate of new recruits increased from 9,500 in 1992 to 54,000 in 1993. This is the strongest recruitment since the inception of the survey in 1991 and is encouraging in that context. The estimate of legal males increased from 65,000 in 1992 to 109,000 in 1993, however, the historic low harvest in the commercial fishery was 226,000 crabs, therefore, the stock cannot support a manageable fishery. The department will continue to use the trawl survey to monitor the stock on an annual basis.

1995 Management Outlook

Recruitment to the legal stock component is expected to decrease slightly in 1994 because estimates of true prerecruit-1 crabs declined from 136,000 in 1992 to 109,000 in 1993. Skip molting also remains a limiting factor in the prerecruit-1 size class where 134,000 (55%) are in an old shell condition. Recruitment is expected to continue to decrease after 1994. Expectations for this trend are based upon Prerecruit-2 estimates which declined from 367,000 in 1992 to 99,000 in 1993. The declines in the prerecruit-1 and prerecruit-2 year classes is illustrated in Figure 2. If weak year classes persist, the stock rebuilding process will be prolonged.

The propagation of weak year classes is a direct function of diminished reproductive capacity. The reduction in the Tanner stock was largely caused by the overharvest of legal, sublegal and even female crabs during the lengthy seasons of the 1970's. The department plans to maintain maximum reproductive potential to insure recovery when ocean conditions favor shellfish production. In this context the near-term goal is to provide maximum reproductive potential, reduce handling and trapping losses, and when possible allow small fisheries similar to the 1986 through 1988 seasons.

KING CRAB FISHERY

Introduction

Three species of king crabs are found in the Prince William Sound Management Area: Red *Paralithodes camtschaticus*, blue *Paralithodes platypus*, and brown *Lithodes aequispina*. Red king crabs are sparsely distributed throughout PWS with historic concentrations occurring in eastern PWS and Hinchinbrook Entrance. Blue king crabs occur in the Port Wells - Harriman Fjord area with other small isolated pockets associated with glacial fjords in western PWS. Brown king crabs are found in central and western PWS at depths of 150-400 fathoms. Waters in the Gulf of Alaska portion of the management area have no documented concentrations except for a very sparse distribution of brown king crabs.

The king crab fishery in Area E is designated as superexclusive. The minimum legal carapace width for red and brown king crab is 7 inches (178 mm) and for blue king crab 5.9 inches (150mm). The regulatory season opens throughout Prince William Sound on October 1 and closes on December 20. A second season opens on January 15 and closes by regulation March 15. The split season allows a three-week period when gear must be removed from the fishing grounds and eliminates the preemption of fishing locations prior to the Tanner crab fishery which opens January 15.

The abundance of red king crabs was ascertained during Tanner crab pot surveys. An annual index was conducted 1977-91 to track the red king crab population. Presently red king crab abundance is assessed through catches in the Tanner crab trawl survey. Brown and blue king crab populations are assessed by commercial fishery dockside interviews and size frequency analysis of commercial catch samples.

Catch reporting by species did not begin until the 1979-80 season (Appendix B). The harvest of nearly 300,000 pounds in 1972 is believed to be primarily blue king crab. During the period

1979-1992 the stocks of both blue and red king crab declined. Fisheries for both species remained closed from the 1984-85 season to the 1991-92 season. These closures coincided with the development of the brown king crab fishery. Fishery performance in the brown king crab fishery indicates that the stock of brown crab is small as evidenced by the low effort coupled with declines in average weight, size, and geographic distribution.

The Alaska Board of Fisheries, at the spring 1988 meeting, adopted a guideline harvest range of 40,000 - 60,000 pounds for brown king crab in Area E. This range was adopted to help stabilize the legal segment of the brown king crab stock from declines in average size, weight, and distribution experienced since the fishery began in 1982. In the short term this guideline may have been established too late because harvests in '89-90 and '91-92 did not attain the low end of this harvest range and the season was closed in '92-93 due to low abundance.

The most recent fishery for king crab in PWS occurred in 1991. Fishing for all three species of king crab opened by regulation in the western portion of Prince William Sound on October 1, 1991. Harvest information from the 1991-92 king crab fishery is confidential due to the low number of participants. There were six registrants for the fishery with only two reporting any catch. All three species of king crab were targeted during the season and the catch per unit of effort was very low. The fishery closed by Emergency Order on November 27, 1991.

1993-94 Season Summary

The commercial king crab fishery in PWS remained closed during the 1993-94 season. Fishery performance data from the 1991-92 season demonstrate that the king crab stocks in PWS are severely depressed. These same data provide no indication of impending recruitment to the legal segment of the stock for any of the species known to occur in PWS. The incidental catch of red king crabs during the department's stock assessment efforts in the eastern portion of PWS indicate that this stock remains depressed. The 1993 trawl survey captured 2 mature red king crab, one male and one female.

1994-95 Management Outlook

The department does not plan to open the king crab fishery for the 1994-95 season. Interviews with participants in the 1991-92 season indicated that the king crab stocks in PWS will remain depressed for several years with brown king crabs the most likely target species in the future. This is based upon reports of very few undersized males and ovigerous females observed during the most recent fishery. More recent anecdotal reports from local fishermen indicate no change in the status of this stock.

The very low number of red king crabs captured in the 1992 and 1993 trawl surveys indicates no change in the depressed status of this stock. Fishery performance data from the 1991-92 fishery also indicated little potential for near term change in this stock's status.

The blue king crab fishery is scheduled to remain closed for the 1993-94 season based on the 1991-92 season fishery performance. Increased recruitment due to immigration is highly unlikely because there is a low probability that this isolated stock is related to other blue king crab populations in Alaska. While fishing during the last regulatory season in 1991-92, fishermen reported very few undersized male and female blue king crabs, therefore, a recovery of the stock is not expected in the near term.

DUNGENESS CRAB FISHERY

Introduction

The Dungeness crab fishery in Area E is classified as "superexclusive". Historically, the major Dungeness crab harvests have come from two areas of Prince William Sound: (1) Orca Inlet District and (2) Copper River District (Figure 3). Dungeness crab are also harvested from the Orca Bay portion of the Northern District and from small populations in western Prince William Sound. However, these harvests have been proportionately small (Appendix C).

Northern District

The Northern District is open year-round. The harvest has been taken either incidental to the Tanner crab fishery or by one or two vessels targeting on Dungeness crab. The district has limited Dungeness crab habitat and a history of low production; for example the recent 10 year average harvest (1984 - 1993) was 684 pounds with effort never exceeding two vessels. These figures include seven years when no harvest occurred. The eastern portion of Orca Bay, which adjoins Orca Inlet, provides Dungeness crab to both the Orca Inlet and Northern districts. Movement generally occurs from Orca Bay into Orca Inlet during the summer with a return to the deeper waters of Orca Bay in the winter.

Orca Inlet District

Orca Inlet, which is immediately adjacent to the community of Cordova, once provided a fishery that allowed participation by small vessels in an area protected from adverse sea conditions. The largest vessels fishing this area were in the 40-foot seiner class. Most vessels made 1-day trips and delivered each fishing day. Harvests have ranged from over a million pounds in the early 1960's to 35,000 pounds in 1976. The limited data available on effort in this district indicates

that for the period 1976 to 1979 the number of vessels ranged from 3 to 34 and averaged 23. This district has a 100 pot limit.

The department has conducted an annual survey in the Orca Inlet district since 1977. The District opens September 1 by emergency order only and closes on May 31. This means that the district remains closed by regulation. It has been closed via regulation since 1980. The September opening occurs only if the department survey indicates both an adequate abundance of Dungeness crabs and completion of the annual molt.

The major reason for the continued suppression of the Dungeness crab population in Orca Inlet is predation by the sea otter. The otter arrived in large numbers during 1980 and immediately impacted the Dungeness crab stock. A sea otter predator/prey relationship study conducted in the late 1970's showed that when Dungeness crabs are available, an otter is capable of eating 10 crabs per day.

Copper River District

The Copper River District fishery, which has a 250-pot limit, is a spring and fall fishery due to a regulatory closure for soft shell crabs during the summer months. The recent 10 year (1984 - 1993) average annual catch and effort were approximately 550,000 pounds and 10 vessels. These figures include 1.5 years when no harvest occurred. The Copper River District is not sheltered from the Gulf of Alaska and the longer running distance to market generally requires larger vessels. Beginning in 1987, split regulatory seasons were implemented in the Copper River District with season dates of March 20 to May 20 and July 25 to December 31. The regulatory closure extends from May 20 to July 25 and is designed to protect the stock from handling mortality during the soft shell period following the annual molt. Additionally, the Controller Bay area closes on October 15. This early closure is designed to reduce gear loss and consequent mortality from storms in this area of shallow water.

The department conducts an annual Dungeness soft shell survey prior to the July 25 opening date. If ten percent or greater of the crabs are in a soft shell condition the fishery is delayed and another survey is conducted in mid-August. The July 25 opening was delayed via emergency order in 1987, 1988, 1990 and 1991 until the crabs had attained an acceptable shell hardness. The opening date in 1987 was August 20, in 1988 September 15, in 1990 August 19 and in 1991 the district opened on August 28.

The 1992 spring season harvest is confidential due to the participation of a single vessel, however, it was well below the previous historical low of 70,259 pounds harvested in 1991. Catch per unit of effort (CPUE) of legal crab averaged 1 for both of the department's 1992 soft shell surveys (July and August) indicating that the stock was depressed. This condition coupled with relatively poor recruitment resulted in the closure of the 1992 fall season fishery by emergency order.

1993 Season Summary

Northern District

No effort occurred in the Northern District in 1993. The district was open for the entire year.

Orca Inlet District

The season was not opened in 1993. The annual survey yielded no Dungeness crabs, therefore, male crab abundance is not expected to increase in the near future. Survey pot bycatch was dominated by yellowfin sole and sea stars. Emergency order closures have been in effect for the subsistence fishery since September 1981.

Copper River District

The Copper River District remained closed during 1993. Department surveys in July and August showed slight increases in the legal stock segment. The survey CPUE of legal males increased from 1 in 1992 to 3 in 1993 (Table 2). The 1993 survey CPUE of legal crab is comparable to that seen in the department's 1991 survey when only 70,259 pounds were harvested. This harvest was approximately 13% of the recent ten year (1984-1993) average of 550,000 pounds.

1994 Management Outlook

The Northern district will remain open year-round.

Orca Inlet will continue to be surveyed; however, a recovery is not anticipated as the sea otter population does not appear to be declining. The department's annual survey in the Inlet also indicated that a fishery in the near term is not likely.

The department plans to continue monitoring the summer molt in the Copper River District via the annual soft shell survey prior to the July 25 regulatory opening date. If the molting period is prolonged, an emergency order will be issued to delay the fishery opening and the department will conduct an additional survey in August. The 1993 survey CPUE of true prerecruit-1 crabs increased to 5 from a level of 3 in 1992 (Table 2). This increase should result in improved recruitment in 1994. However, if department surveys detect another weak recruitment event and CPUE remains low, the fishery will remain closed.

POT SHRIMP FISHERY

Introduction

The Prince William Sound pot shrimp fishery targets on spot shrimp and to a limited extent coonstripe shrimp *Pandalus hypsinotus*. Commercial landings were first documented in 1960 when 4,100 pounds were harvested. From 1960 until 1977, catch varied from no reported harvest in 1962 and 1966 to a high of 20,000 pounds in 1974 (Appendix D.)

The pot shrimp fishery expanded rapidly after 1978 with increases in both catch and effort. Growth of the fishery was greatest from 1978 through 1982. During this period local markets were established and the major harvesting areas located. Landings increased from 12,000 pounds in 1978 to 178,000 pounds in 1982. Similarly, effort increased from 9 to 57 vessels during this period. Harvests were stable from 1982 through 1984 due to a management strategy which employed the following:

1) Elimination of year-round fishing, and seasons set to avoid fishing during peak egg bearing periods.

2) Establishment of a guideline harvest range based upon historical harvests.

In September of 1984 the Alaska Board of Fisheries adopted a spot shrimp management plan. The plan established three fishing areas: the Traditional Harvest Area (THA), Montague Strait Experimental Harvest Area (MSEHA), and the Eastern Harvest Area.

In 1990 the Board of Fisheries eliminated the MSEHA and incorporated these waters into the Traditional Harvest Area. The MSEHA was originally established as an experiment to determine if continuous fishing would depress the shrimp stock. Subsequently, due to continuous fishing from 1985 - 1988, a stock conservation problem developed. Catches declined

in the MSEHA from approximately 46,500 pounds in 1986 to 2,000 pounds in 1988. The department closed this area in October 1988.

The majority of pot shrimp are caught in the northern and western portions of Prince William Sound (Traditional Harvest Area) which are characterized by numerous steeply cut glacial fjords and passages. This area encompasses the northern shore from Port Valdez to Whittier and all of western and southwestern PWS including Montague Strait (Figure 4). Market access is through the ports of Whittier, Valdez and Seward, which have direct transportation ties with the Anchorage metropolitan area. This accessibility has been the key to development of fresh markets for unprocessed spot shrimp because the product can be utilized shortly after capture. The Prince William Sound pot shrimp fishery is unique in that participants vary from full-time to seasonal and weekend fishermen. This heterogeneous mix has split the industry as to the desired season of harvest.

Two regulatory fishing seasons occur per calendar year in the Traditional Area. The spring season opening date was changed by the Board of Fisheries during the 1990 Board meeting. The spring season now opens on May 1 rather than March 15. The justification for delaying the season opening was a desire to avoid harvest during the egg release period. The spring season closes on June 30. The fall season begins on August 15 and continues until December 15. The annual guideline harvest range is 150,000 - 200,000 pounds split evenly between the two seasons. Either season may be closed earlier by emergency order if the harvest level is achieved. When excessive harvest occurs during the spring season the poundage is deducted from the fall season.

The Board of Fisheries also adopted two new gear related proposals during the March 1990 Board meeting. The first regulation placed a limit of 150 pots per vessel. The second regulation was intended to provide protection to small, nonsalable size shrimp by requiring rigid 7/8" mesh which would allow these shrimp to escape. Pots with a definable side must have at least two adjacent sides completely composed of the rigid mesh. Round pots must have rigid mesh covering a minimum of 50% of the vertical surface area of the pot.

The Eastern District has a very low production history and is designated as a year-round fishery. Harvests in this District have averaged less than 1,000 pounds. Due to low effort, catches are held confidential. A Commissioner's permit is required for this area to allow the monitoring of effort and catch via mandatory logbooks and department contact.

In 1989 the department began a survey of spot shrimp in the THA to assess the spot shrimp stocks. Six stations in the northern, western, and southwestern portions of PWS have been surveyed annually since 1989. Two experimental stations in the southwestern Sound were added in 1991. Data from the survey, specifically CPUE and sex ratios are used in making management decisions regarding the fishery.

The total annual harvest from Prince William Sound declined rapidly from 290,632 pounds in 1986 to 29,315 pounds in 1989. In 1990 the catch was 36,737 pounds. The fishery was closed by emergency order due to low abundance. Although the subsequent survey continued to indicate a depressed stock, the department wanted to further validate the survey data via a limited commercial fishery. The 1991 fall spot shrimp fishery in the Traditional Harvest Area provided this opportunity.

The fishery opened September 10 by emergency order.A reduced preseason guideline harvest range (GHR) of 10,000 to 40,000 pounds whole shrimp weight was set by the department. The reduction was in response to fishery performance as well as the department's 1990 survey data which indicated that the stock was depressed and the number of spawning females low. The survey, however, also showed a moderate year class of males which had the potential to recruit into the fishery in 1991.

The 1991 commercial harvest of pot shrimp in the Prince William Sound Management Area was 17,580 pounds (whole shrimp weight). The harvest by species was 17,302 pounds of spot shrimp and 278 pounds of coonstripe shrimp. The harvest was taken by 15 vessels which made 45 landings. All but a very small percentage of the catch was taken in the Traditional Harvest

Area. Catch and effort data from the Eastern District are confidential due to the low number of participants.

The department initiated a voluntary logbook program to aid in data collection during the 1991 fishery. Participation was high at 65%. Logbook and fish ticket data showed that the harvest was indicative of stock condition because fishing effort was distributed throughout the THA. These data also indicated no improvement in CPUE since the spring 1990 fishery. Furthermore, the overall CPUE from the 1991 fishery and the department's fall 1990 survey were comparable at 0.83 and 0.86 pounds of whole shrimp per pot (Table 3). Therefore, although the relative numbers of females appeared to have increased indicating that some of the growth potential of the respective year classes was realized, the overall weight of the per-pot catch remained low. The fishery closed by emergency order on October 25, 1991.

The commercial spot shrimp season remained closed in the THA through 1992 due to low abundance. Fishery performance data from the 1991 fishery indicated that the stock remained in a depressed condition. The data were also supported by the department's November 1991 spot shrimp survey in which CPUE averaged 1.3 pounds of whole shrimp per pot. Although this figure indicates some improvement in the depressed condition of the stock, catches of females and shrimp in the salable size range remained low.

1993 Season Summary

The Eastern district remained open to harvest through 1993, however, there was no effort.

Commercial fishing in the THA was closed in 1993 due to continued low abundance. The October 1992 spot shrimp survey showed a decline in the abundance of adult spot shrimp with a CPUE of 0.8 pounds of whole shrimp per pot. Survey catches of spot shrimp at experimental stations in southwestern PWS declined as well with CPUE dropping from 1.3 in 1991 to 0.6 in 1992 (Table 4).

1994 Management Outlook

Traditional Harvest Area

The 1993 annual spot shrimp survey within the THA indicated further decline in the overall stock of spot shrimp with CPUE decreasing at all survey stations but one. Catch weight at this location remained the same. Catch per pot in the 1993 survey averaged 0.4 pounds of whole shrimp per pot (Table 3). Based upon these data, the department intends to close the fishery for 1994. The October 1994 spot shrimp survey will occur after the period of summer growth. This survey will provide the basis for a management decision regarding the 1995 fishery.

It is apparent that a conservative management approach for the immediate future is warranted for the following reasons:

1) The number of female and large male shrimp is low. If a fishery is permitted, these shrimp will be targeted as salable and the abundance of this size range will decline further thereby reducing the brood stock and increasing the risk of future recruitment failure.

2) Spot shrimp are long lived and slow growing further emphasizing the need to keep fishing mortalities low.

Eastern Prince William Sound

The department plans to allow year-round fishing in this area during 1994. Production remains low and it appears that no significant quantities of spot shrimp exist. All shrimp harvests in this district have occurred within PWS. The Gulf of Alaska portion of this area does not provide the habitat required for spot shrimp.

TRAWL SHRIMP FISHERY

Introduction

Emphasis in the trawl shrimp fishery has shifted from the harvest of pink shrimp *Pandalus borealis* in southwestern Prince William Sound to sidestripe shrimp in northwestern PWS (Figure 5). Large Kodiak based vessels harvested pink shrimp in southwestern PWS and constituted the main effort during the early 1980's. The fishery for pink shrimp declined due to the low ex-vessel value of pink shrimp, limited processing capabilities and poor pink shrimp stock conditions (Appendix E).

The first documented harvests of sidestripe shrimp occurred in 1983 around the Icy Bay area, however, recent activity has focused on northwestern PWS. Increased harvests of sidestripe shrimp began in 1985. The reason for the sudden expansion was the development of markets and gear by fishermen with small vessels, targeting on stocks which were previously unfished. Sidestripe tails are sold fresh in Anchorage while markets for whole, fresh and frozen sidestripes exist in both Anchorage and Japan.

After the trawl fishery for pink shrimp was fully developed, catches ranged from 171,000 pounds to 1.3 million pounds and effort ranged from 3 to 14 vessels. Since sidestripe shrimp became the predominant species of harvest in 1987, catch and effort have expanded from 96,000 pounds to 246,000 pounds and 2 to 7 vessels respectively. The incidental harvest of pink shrimp during this same period ranged from 275 to 3,500 pounds.

At the spring 1986 shellfish meeting the Board of Fisheries (BOF) established a fishing season of March 1 through November 30 for sidestripe shrimp fishing in northwestern Prince William Sound. Subsequently in 1990 the Board adopted a split season of April 1 through August 15 and September 15 through December 31. The spring opening date was changed to delay fishing in the spring to allow for completion of the egg release. The closure from August 16 through

September 14 was proposed by a fishermen who indicated to the Board that soft-shell shrimp were prevalent in the catch during that time. The season was extended to December 31 to enable fishermen to provide shrimp for holiday markets.

As catch and effort increased, the department became concerned for the conservation of the sidestripe shrimp resource in Port Wells. In April 1990 the department initiated a program utilizing onboard observer data to calculate an area-swept estimate of trawlable shrimp abundance for the Port Wells area. A 20% harvest rate was applied to the estimate. In 1990, 1991, and 1992 this method yielded harvest levels of 65,000, 80,000 and 65,000 pounds respectively. For the period 1990 through 1992, fishery closures were effected by emergency order in the Port Wells area on August 15, June 23, and June 3 due to attainment of the respective harvest levels.

In summary the regulatory measures for trawl shrimp are:

1) April 1 - August 15 and September 15 - December 31 fishery dates in the Northwestern area.

2) Cod end mesh restriction during the entire season in the Northwestern area. Cod ends must be at least 15 feet in length with at least 12 feet composed of 1 7/8 inch stretched mesh hung horizontal and perpendicular to the mouth of the trawl.

3) No more than 10% by weight of the shrimp in possession may be pink shrimp in the Northwestern area.

4) A year-round closure in eastern Prince William Sound (Port Fidalgo, Orca Bay and Hinchinbrook Entrance, north Montague) to minimize indirect fishing mortality on king and Tanner crab stocks in these key production areas.

5) May 1 - February 28 fishery dates in both the Icy Bay district and the central/southwest portions of PWS.

6) A 250,000 - 600,000 pound guideline harvest range for the Icy Bay District, which is in southwestern PWS.

7) A June through August fishing season in the Northern Herring Fishing District to avoid conflict with herring season closures.

1993 Season Summary

The sidestripe shrimp season in northwestern PWS opened by regulation on April 1, 1993. The central and southwest portions of PWS opened on May 1 and the Valdez Arm area opened June 1.

The department continued to collect onboard observer data in 1993 during the commercial fishery in Port Wells. A biomass estimate, using area-swept data collected from a commercial vessel, was established for *Pandalid* shrimp in the Port Wells area and a 20% harvest rate was applied to this estimate yielding a 46,000 pound quota. The quota was taken by May 20, 1993 and the season in Port Wells was subsequently closed for the remainder of the year. The balance of the northwestern area remained open through the first half of the regulatory season. Commercial catch samples indicated that the sidestripe stock in the Port Wells area was composed of 32% juveniles, 47% males, 13% transitionals and 8% females.

As the trawl fishery for sidestripe shrimp expanded into the remainder of the management area, staff became concerned about overharvest of the resource. Concurrently, catches in more established fishing areas had declined. In order to begin to address this potential problem, the 1993 harvest guideline for the entire management area was set at 246,000 pounds which was the historical high catch of sidestripes in PWS. As a result of the 53,000 pounds harvest in Port Wells, the guideline for the remainder of PWS was 193,000 pounds.

The 1993 trawl shrimp harvest from Prince William Sound including Port Wells was 246,190 pounds of whole shrimp taken by 7 vessels in 72 landings. This is the second year at the historical high harvest level since the fishery began targeting sidestripes in 1985. Sidestripe shrimp dominated the 1993 landings at 190,976 pounds. Incidental landings of pink shrimp and

other miscellaneous shrimp equalled 74 pounds. Approximately 55,140 pounds of deadloss (pink shrimp, crushed or small sidestripes) were reported on fish tickets, however, reporting of deadloss remains incomplete. Deadloss typically accounts for 5% to 45% of the shrimp catch depending upon the vessel and its markets. Some vessels report no deadloss and others only a small proportion of the actual amount. The entire management area closed by emergency order on September 20, 1993 due to attainment of the harvest level.

Trawl shrimp landings occurred April through September. Six of the seven vessels participating in the fishery operated otter trawls; the other was a beam trawl. Vessel length ranged from 32' to 90'. The average ex-vessel value for trawl-caught shrimp was $2.04 per pound, whole shrimp weight giving a fishery value of approximately $502,000.

1994 Management Outlook

The department will continue to manage the sidestripe trawl fishery in the Port Wells area via a 20% harvest rate applied to an area-swept population estimate generated from commercial trawl vessel data. Fishery performance data indicate that the sidestripe stock in the Port Wells portion of the Northwest area has declined from earlier years. Catch per hour towed declined by approximately 50% from 1991 to 1992. Catch rates in 1993 declined slightly from 1992 levels. As a result there is a strong likelihood of a reduced harvest level in 1994. Effort in the fishery is expected to continue to increase resulting in the early attainment of the guideline harvest level and prompting an early closure similar to the past two seasons. As seen in 1993, an early closure of the Port Wells area will likely disperse effort and result in increased pressure on recently developed harvest areas and possibly, development of new harvest areas.

The central portion of PWS, which accounted for approximately 60% of the 1993 harvest, is expected to continue to be a significant contributor to the catch. The preseason guideline harvest level for this area will be set at 155,000 pounds which is equal to the 1993 harvest. The department plans to continue monitoring the catch from this area for significant changes in

CPUE via logbooks and may establish a harvest level using a survey methodology similar to that used in the Port Wells area.

Due to low ex-vessel value and limited abundance no fishery targeting on pink shrimp is expected in southwestern PWS in 1994.

RAZOR CLAM FISHERY

Introduction

Beginning in 1916 and continuing into the mid 1950's, Cordova was known as the "razor clam capital of the world". Although historical fishery statistics are imprecise, it appears that the majority of razor clams were harvested from Orca Inlet and the western Copper River Delta (Figure 6). The eastern Copper River Delta, which includes Kanak Island, was not a substantial contributor to the early harvests. Catches during this time ranged from 3.6 million pounds in 1917 to a frequent harvest of over one million pounds. Most of the product was canned and used for human consumption.

The razor clam industry began to decline in the 1950's for a number of reasons:

1) Economic: the east coast clam fishery gained economic dominance
2) Biological: substrate change caused largely by alteration in the Copper River outflow that severely affected juvenile survival,

The "Good Friday Earthquake" in 1964 caused significant uplift in prime razor clam habitat in Orca Inlet. Loss of habitat resulted in record low harvests in the 70's and early 80's (Appendix F). The majority of the production since the mid-70's has come from the eastern Copper River Delta which includes Kanak Island.

In the late 50's and early 60's, commercial demand for razor clams shifted from human consumption to Dungeness crab bait. The demand for razor clams for human consumption increased again in 1983 when a decline in clam abundance in Washington state led to an expanded fishery in Prince William Sound. Since 1983 the majority of the clam harvest has been taken at Kanak Island beach with minor amounts coming from Softuk and Katalla beaches on the eastern Delta. Yearly harvests during the 1980's attained a maximum of 170,000 pounds in 1984 with a recent ten year (1981 - 1990) average annual harvest of 45,000 pounds and an average of 16 diggers.

The department monitors commercial razor clam harvests via fish ticket information. The non-commercial harvest is monitored through a permit system which requires a harvest report. The minimum legal size of clams is 4.5 inches (114 mm) in length.

A guideline harvest range of 100,000 to 150,000 pounds is in effect for the combined commercial and sport/subsistence harvests from Kanak Island. By regulation, clams harvested from Kanak Island must be used for human consumption as food. Kanak beach receives annual certification by the Alaska Department of Environmental Conservation (ADEC). Certification allows bivalves to be sold for human consumption. Kanak beach was inspected and certified in June of 1993.

Although Kanak Island is designated for human consumption, the department has difficulty enforcing this regulation. Sand bars near Kanak, that are exposed at low or minus tides, have been the source of bait clams. For enforcement purposes, the department has defined Kanak Island as all tidelands that have a physical land connection with Kanak Island during any tide stage.

1993 Season Summary

Razor clams were commercially harvested by a single permit holder in 1993, a level of effort which makes catch information confidential. Total commercial harvest was less than the non-commercial catch.

The reported non-commercial harvest (subsistence, sport and personal use) during 1993 was 1,131 pounds. The department issued 82 non-commercial permits for the Copper River Delta of which 39 dug clams, 29 did not dig, and 14 did not report. Harvest was greatest from Katalla beach with 640 pounds taken by 18 diggers. Kanak Island, Softuk bar, and Egg Island accounted for the balance of the harvest with 308, 168, and 15 pounds taken by 14, 7, and 1 diggers respectively.

1994 Management Outlook

Ex-vessel value of razor clams has not substantially increased for several years. Bait and food clams command a similar price per pound. The local bait clam market has been poor since 1991 due to the depressed Dungeness stocks on the Copper River Delta. Unless an increased demand for food clams occurs, the harvest will remain well below the guideline harvest range of 100,000 to 150,000 pounds set for the beach at Kanak Island. If effort increases at Kanak Island the department will monitor the beach via catch per unit of effort data.

Although the department does not conduct population estimates, reports from non-commercial diggers indicate that razor clam abundance has declined over the previous five years on the eastern delta.

WEATHERVANE SCALLOP FISHERY

Introduction

A fishery for weathervane scallops developed in the PWS management area in 1992. Although landings have occurred from the Yakutat area to the east since the late 1960's, the 1992 harvest constitutes the first documented commercial scallop landings from Area E.

The 1992 harvest of weathervane scallops in the PWS management area totalled 208,836 pounds of meats taken by 4 boats. This poundage equates to approximately 2.1 million pounds whole scallop weight. The commissioner's permit was a management tool used to require fishermen to submit logbooks and weekly catch reports. Harvest occurred from two statistical areas (202-09 and 202-10) in the Kayak Island vicinity. Waters of PWS and nearshore Gulf waters remained closed to scallop dredging due to department bycatch concerns for depressed Tanner and Dungeness crab stocks. Fishing began in late February and closed by emergency order on April 23. The closure was based upon an allowable harvest of 64,000 pounds meat weight which was established by developing an area-swept scallop biomass estimate using fishery performance data and applying a 10% harvest rate. This harvest rate is identical to that specified by the Board of Fisheries for the Cook Inlet scallop fishery.

Vessel length ranged from 74' to 147' and each towed two 15' New Bedford style dredges. Participants delivered both fresh and frozen product. The average price was $3.98 per pound making the fishery worth approximately $831,000.

The discrepancy between allowable (64,000 lbs) and actual harvest (208,836 lbs) is directly attributable to a lack of timely and accurate catch reporting. As the fishery progressed, both effort and the geographic area fished increased. Information gathering was difficult because the majority of landings occurred at a port with no department staffing. Collection of data inseason was accomplished by weekly radio reports of estimated catch, however, actual catch by each

vessel was not ascertained until the time of landing. Errors in radio reports of estimated catch were not evident in some cases for up to 2 weeks. The time delay was attributable to fishing trip length and the time necessary for a fish ticket to arrive via mail. By the time that a picture of scallop stock distribution and density had emerged, the harvest had progressed to an estimated 150,000 pounds. When the fishery closed three days later the harvest was approximately 209,000 pounds meat weight.

After the eastern Gulf portion of the management area closed, participants expressed an interest in exploratory fishing in the western Gulf portion of the area. Effort in the western Gulf portion of the management area was low with only two participants and no reported harvest.

1993 Season Summary

In response to the increases in scallop harvests statewide, the department initiated development of an interim fisheries management plan under 5 AAC 39.210. Management Plan for High Impact and Emerging Fisheries. This interim management plan was formulated and implemented prior to the July opening date in PWS.

Key features of the PWS portion of the plan include:

1. Area registration.
2. Gear requirements including 4" ring size and maximum of two 15' dredges.
3. 50,000 pound meat weight GHL.
4. Bycatch caps of 500 and 130 Tanner crabs east and west of 147°00' W. longitude.
5. Seasons set by emergency order.
6. Industry-funded Observer Program.
7. Crew size limit of 12.

The 1993 scallop fishery in the PWS management area opened on July 15 at 12:00 noon. Prior to fishing each vessel was required to register and each observer was briefed. Radio contacts were made twice daily with each observer reporting fishing area, number of tows, sampling intensity, crab bycatch, and scallop catch.

Two fishing area were established (Figure 7):

1. Eastern Area - waters east of 147°00' W. longitude and south of 60°00' N. latitude.

2. Western Area - waters west of 147°00' W. longitude and south of 59°45' N. latitude.

The Eastern area comprised the area of primary harvest with a quota of 50,000 pounds meat weight. The Western area opened to provide an opportunity for exploratory fishing with an initial quota of 5,000 pounds.

Seven vessels ranging in length from 81' to 145' participated in the fishery. The scallop harvest from the Eastern area totalled 63,068 pounds meat weight. Catch per tow and tow length averaged 231 pounds meat weight and 51 minutes. The fishery closed in the eastern area by emergency order on July 18, 1993 at 7:00 a.m. resulting in a fishery duration of 67 hours (2.8 days).

Four vessels made tows in the western Gulf area after the Eastern area closed. No catch was reported from this area.

1994 Management Outlook

Fishing in 1992 and 1993 indicated that the PWS area scallop stock is confined to two relatively small areas. Experimental fishing in both 1992 and 1993 the western Gulf of Alaska portion of the management area yielded no indication of a commercial scallop resource. The harvest level

for the PWS management area will be 50,000 pounds meat weight. Effort for scallops appears to be increasing statewide, therefore, it is reasonable to expect the PWS fishery to experience a similar increase. Given the current allowable harvest level, any increase in effort will likely result in a fishery of very short duration.

MISCELLANEOUS SHELLFISH

Squid and Octopus

Small quantities of squid were landed during commercial shrimp trawl fisheries. Due to the small number of participants (2), the harvest information is confidential. Octopus harvested incidentally to the longline and pot groundfish fisheries totalled 4,500 pounds. These were the only reported landings of octopus.

Sea Cucumbers and Urchins

There have never been any reported landings of sea cucumbers or urchins from the PWS management area. The department conducts no formal surveys of either sea cucumbers or urchins. The most recent effort for sea cucumbers occurred in 1992 when five permits were issued, however, no catch was reported. This is consistent with annecdotal reports on abundance from both department and sport divers.

No permits have been issued for sea urchin harvest. Anecdotal information indicates few urchins of a marketable size in PWS.

Table 1. Shellfish Emergency Orders, Prince William Sound Management Area, 1993-94.

Fishery	Emergency Order #	Effective Date	Explanation
Tanner	2-S-E-01-94	01/15/94	Commercial - Closed the entire management area to Tanner crab fishing due to low stock abundance.
	2-S-E-02-94	01/04/94	Personal Use - Closed northern Montague Hinchinbrook entrance and Orca Bay due to low stock abundance.
	2-S-E-03-94	01/11/94	Subsistence - Closed northern Montague Hinchinbrook entrance and Orca Bay due to low stock abundance.
King	2-S-E-10-93	10/01/93	Commercial - Closed entire management area due to low abundance.
	2-S-E-11-93	10/01/93	Personal Use - Closed northern Montague, Hinchinbrook Entrance, and Orca Bay to subsistence king crab fishing due to low stock abundance.
	2-S-E-12-93	10/01/93	Subsistence - Closed northern Montague, Hinchinbrook Entrance, and Orca Bay to subsistence king crab fishing due to low stock abundance.
Dungeness	2-S-E-08-93	07/25/93	Commercial - Closed Copper River District fishery until July 25, 1994 due to low abundance.
Pot Shrimp	2-S-E-04-93	05/01/93	Commercial - Closed the western side of Prince William Sound (formerly Traditional Harvest Area) to fishing for the 1992 season.
Trawl Shrimp	2-S-E-05-93	05/20/93	Commercial - Closed the Port Wells area due to attainment of guideline harvest level.
	2-S-E-09-93	09/20/93	Commercial - Closed PWS management area to trawling for shrimp.
Scallop	2-S-E-06-93	07/15/93	Commercial - Opened commercial scallop fishing in identified Gulf waters of PWS area
	2-S-E-06-93	07/18/93	Commercial - Closed eastern portion of Gulf waters to scallop fishing.

Table 2. Copper River District Dungeness crab survey average catch per pot of legal, sublegal and female crabs, 1985 - 1993.

Year	Number of Pots	Legal Crabs	True Recruits		Sublegal Crabs	Newshell Sublegal		Female Crabs
1985	65	9.4	8.3	(88%)	5.4	3.3	(61%)	0.0
1986	80	9.1	7.3	(80%)	9.7	2.2	(23%)	5.3
1987	80	9.7	5.6	(58%)	10.5	4.4	(42%)	9.8
1988	80	10.7	7.4	(69%)	12.1	3.7	(31%)	12.0
1989	80	12.1	1.0	(8%)	5.4	0.4	(7%)	6.8
1990	80	7.7	2.6	(34%)	9.8	2.0	(20%)	8.5
1991	80	2.6	1.4	(54%)	9.6	1.9	(20%)	12.8
1992	80	1.2	0.6	(50%)	10.9	3.2	(29%)	1.1
1993	80	2.6	1.3	(50%)	13.3	5.3	(40%)	0.6

Table 3. Traditional station catch statistics from the PWS spot shrimp surveys, 1989 - 1993.

Year	1989	1990	1991	1992	1993
Number of pots	132	197	194	261	250
Number of pounds	170	176.8	259.8	202.1	104.7
Mean weight per pot (lb)	1.3	0.9	1.3	0.8	0.4
Number of shrimp	5192	4283	5964	3962	2075
Mean # shrimp per pot	39	22	31	15	8.3
Number of males	4958 (96%)	3910 (91%)	5535 (93%)	3480 (88%)	1654 (80%)
Number of females	234 (4%)	373 (9%)	429 (7%)	482 (12%)	421 (20%)
Number of ovigerous females	213	343	324	463	413
Mean size males (mm)	27.7	29.3	30.5	31.7	28.1
Mean size females (mm)	41.3	41.9	41.3	41.9	42.5

Table 4. Experimental station catch statistics from the PWS spot shrimp surveys, 1991 - 1993.

Year	1991	1992	1993
Number of pots	11	110	86
Number of pounds	1.2	70.4	19
Mean weight per pot (lb)	0.1	0.6	0.2
Number of shrimp	25	1233	432
Mean # shrimp per pot	2	11	5
Number of males	24 (96%)	1085 (88%)	371 (86%)
Number of females	1 (4%)	148 (12%)	61 (14%)
Number of ovigerous females	1	147	58
Mean size males (mm)	31.4	33.0	27.5
Mean size females (mm)	40.4	43.0	43.3

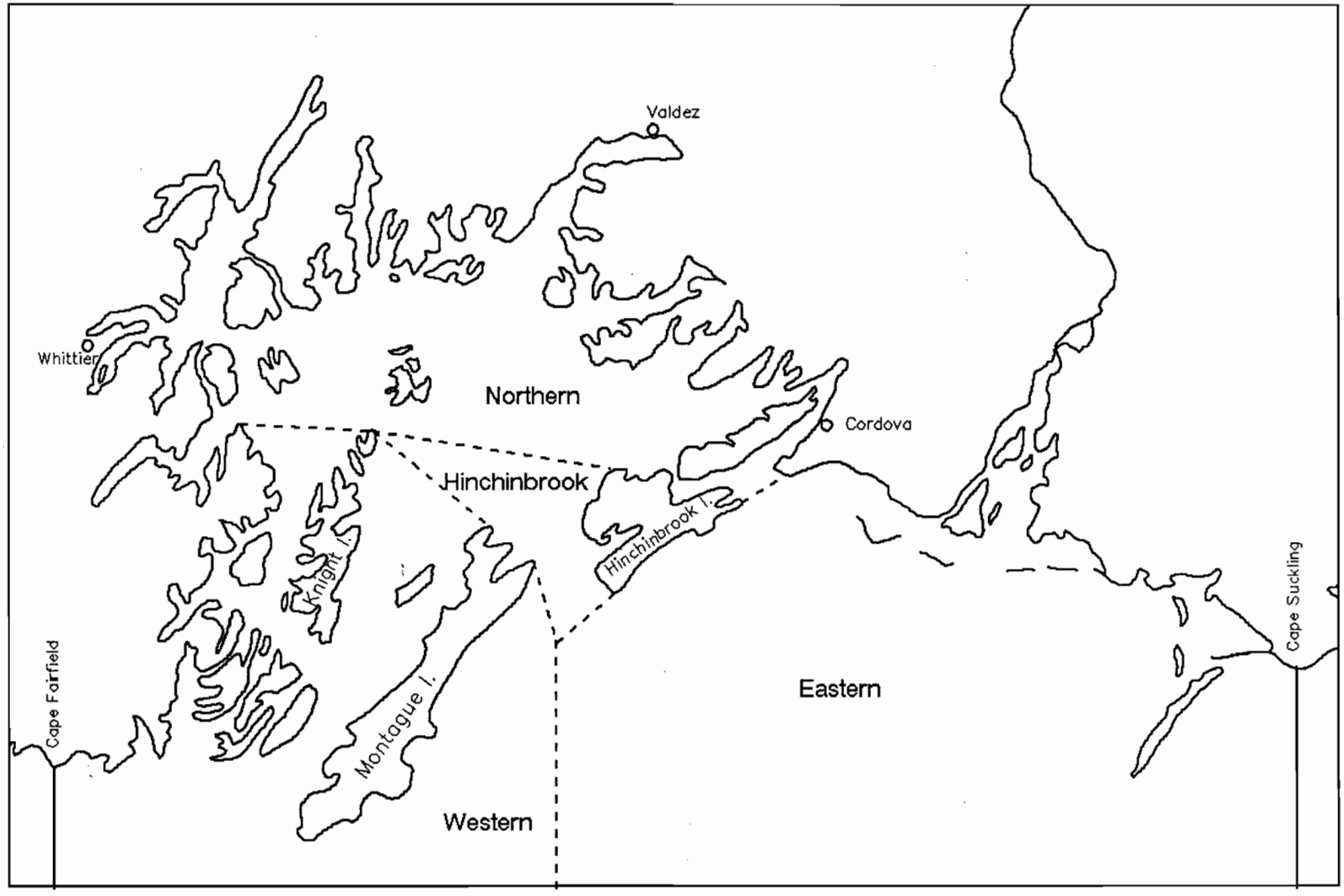

Figure 1. Prince William Sound Tanner Crab Fishing Districts.

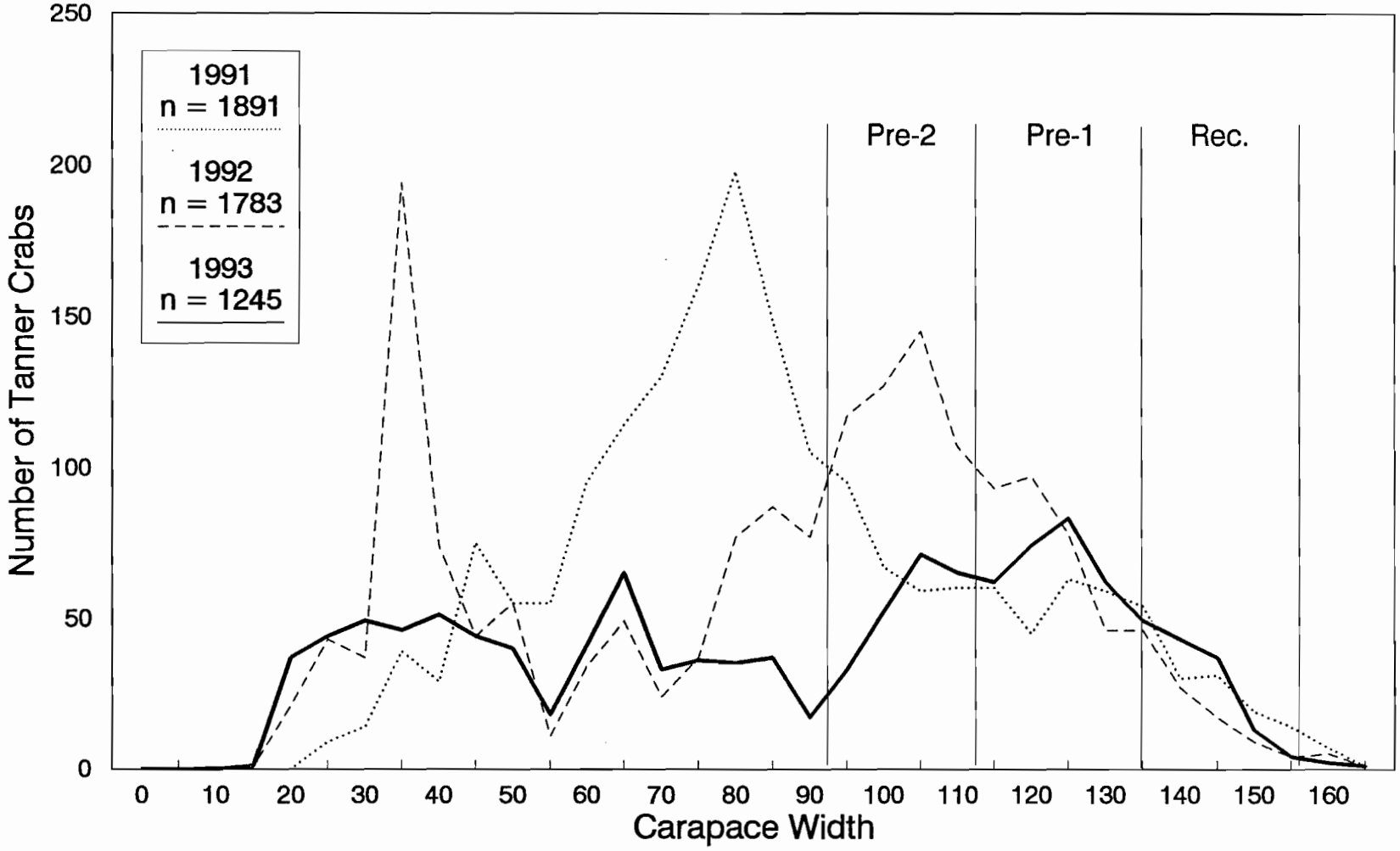

Figure 2. Male Tanner crab size frequencies from the Northern and Hinchinbrook Districts, 1991 - 1993 PWS trawl surveys.

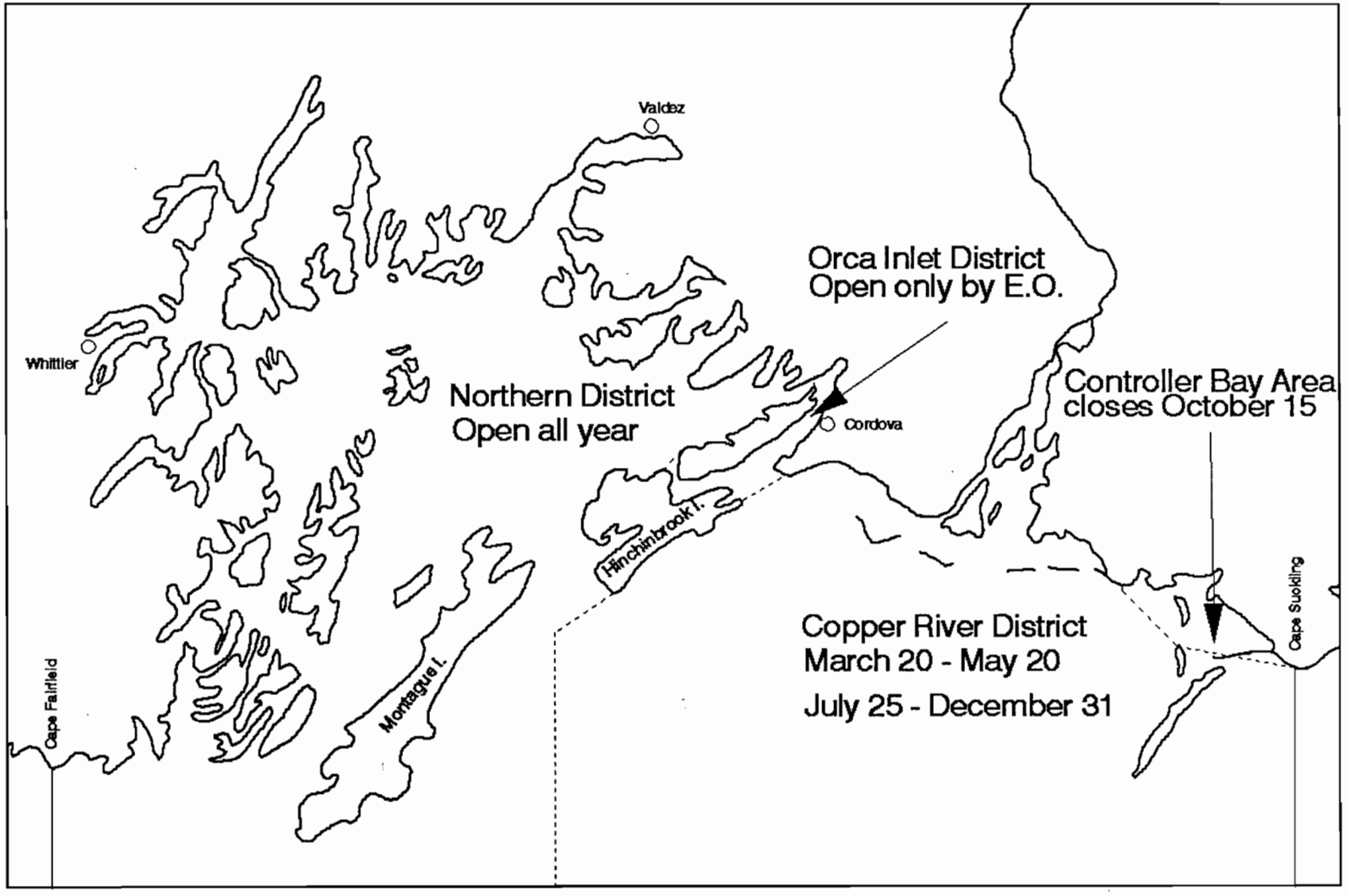

Figure 3. Prince William Sound Dungeness fishing seasons and districts.

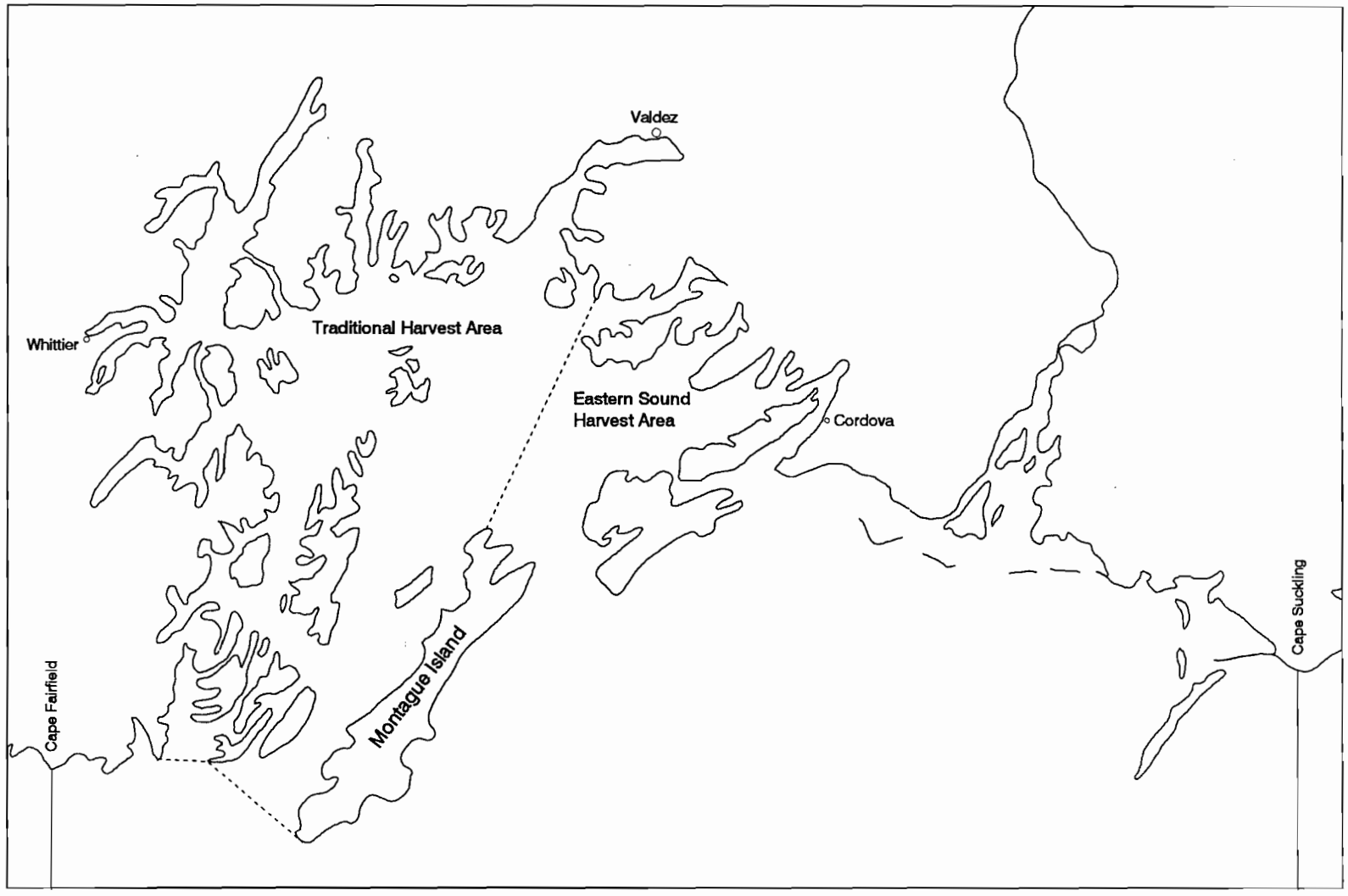

Figure 4. Prince William Sound pot shrimp management areas.

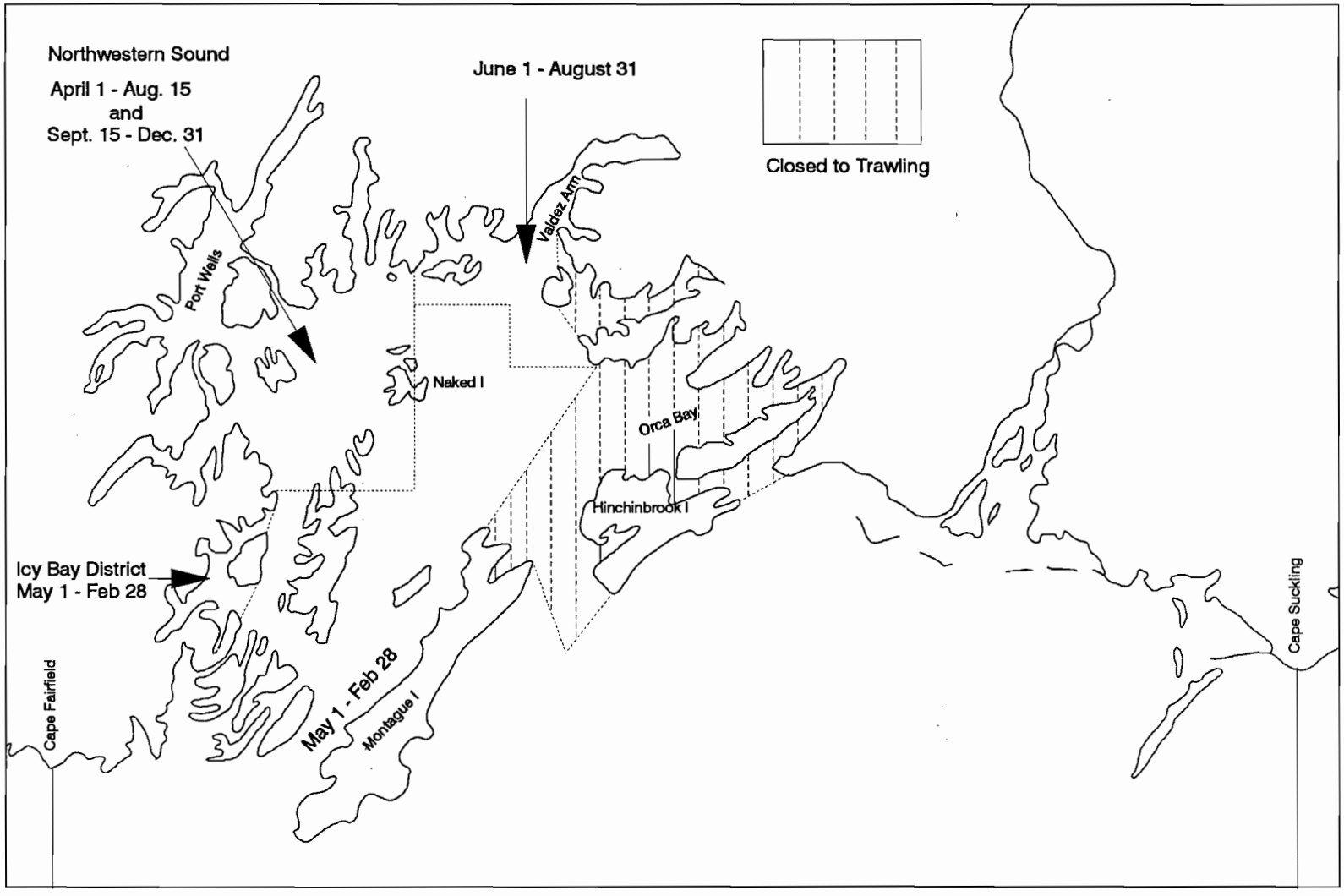

Figure 5. Prince William Sound trawl shrimp fishing areas and seasons, 1993.

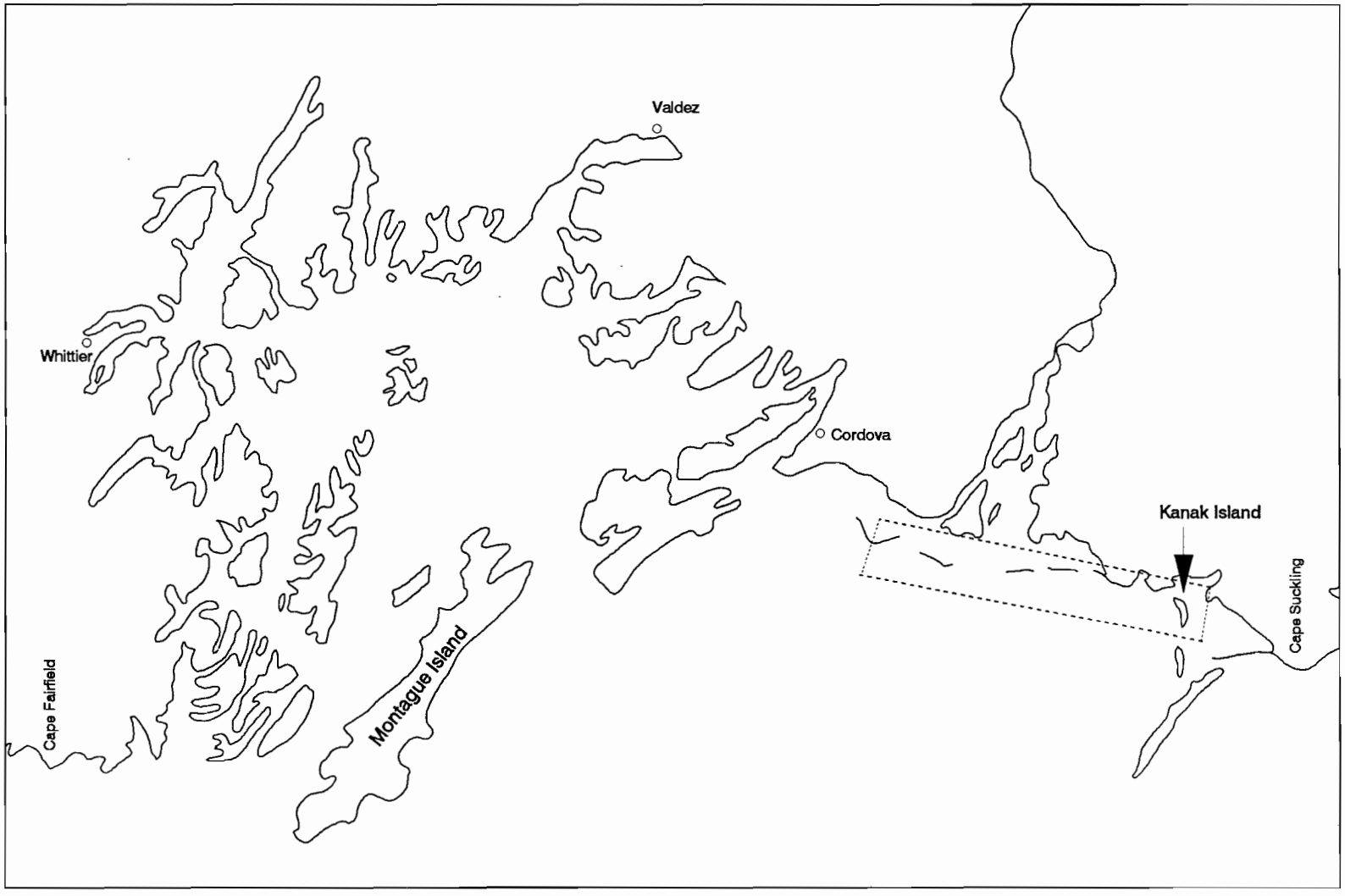

Figure 6. Copper River Delta razor clam harvest area.

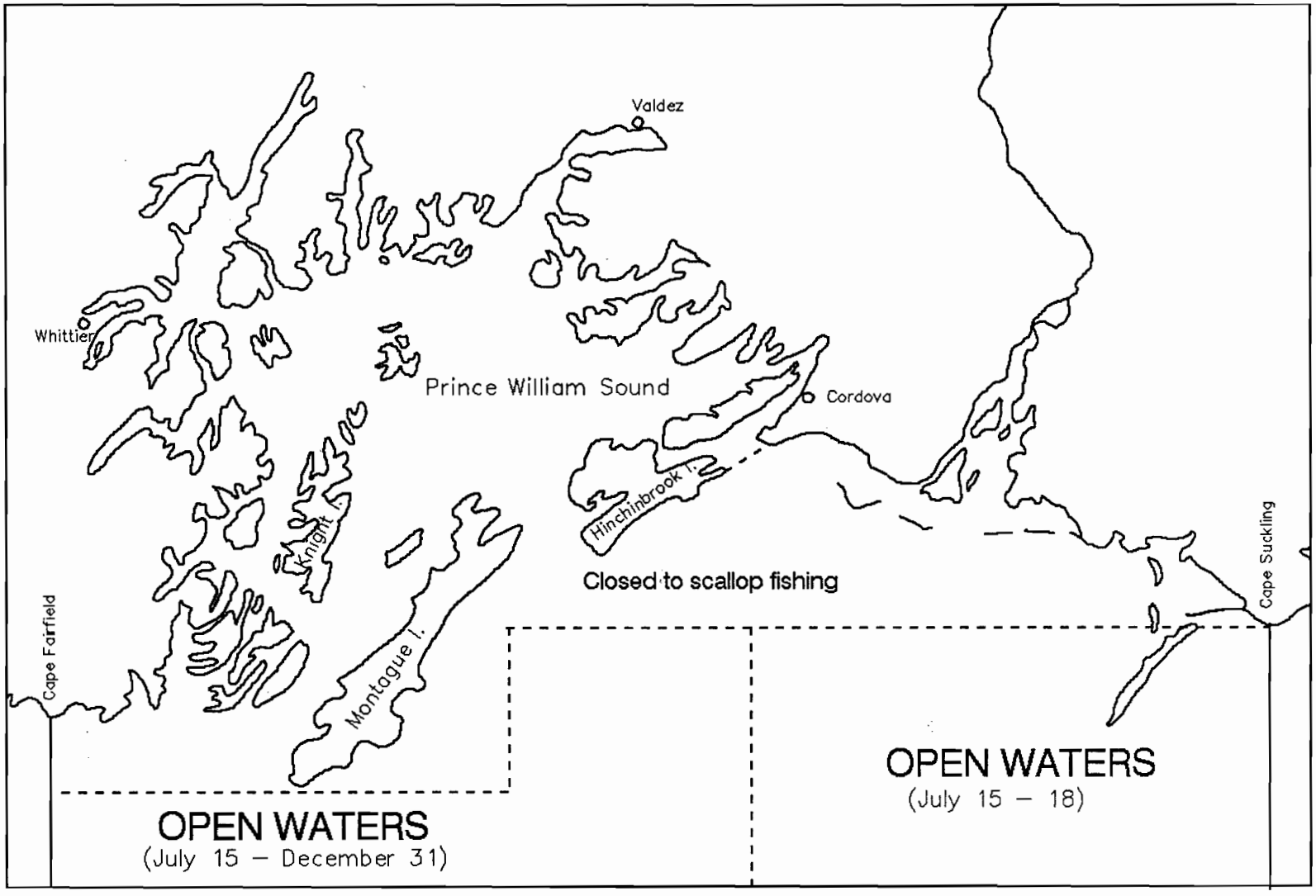

Figure 7. Prince William Sound scallop fishing areas in 1993.

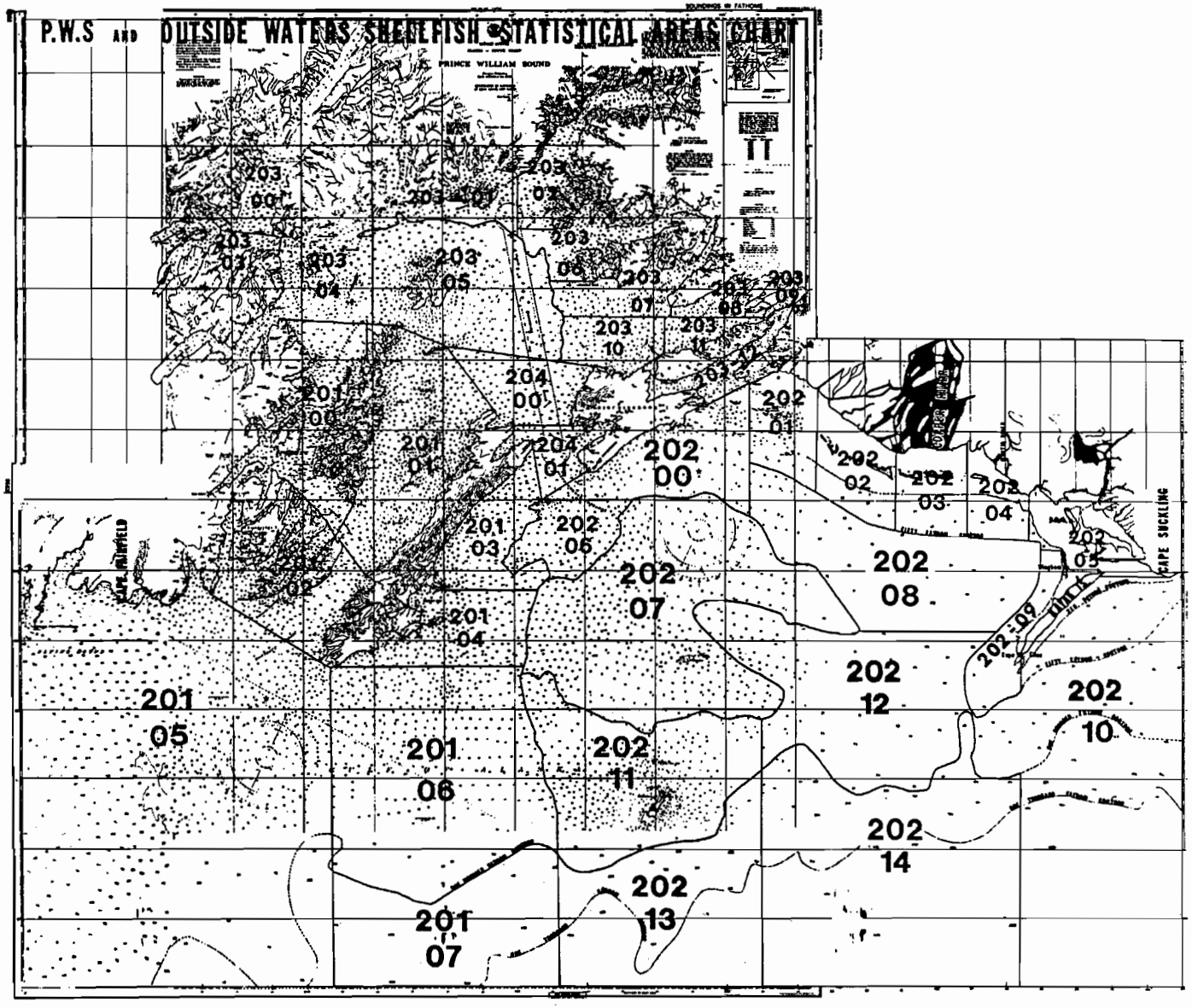

Figure 8. Prince William Sound and outside waters shellfish statistical areas chart.

Appendix A. Prince William Sound Area historical Tanner crab catch in pounds, by season 1968 - 1993.

Season	Inside	Outside	Total	Vessels	Lndgs	% Recruit	Avg. Wt.	# Crab
1968-69			1,235,613					
1969-70			1,284,597					
1970-71			4,159					
1971-72			7,788,498					
1972-73			13,927,868					
1973-74	1,658,000	8,500,000	10,158,000					
1974-75	1,187,000	2,667,000	3,854,000					
1975-76	3,322,482	3,810,262	7,132,744					
	Northern	Hinchinbrook	Western	Eastern						
1976-77(1)	782,048	766,650	701,725	70,925	2,321,348	23	316			
1977-78	994,721	1,161,831	2,079,549	570,573	4,806,674	38	591		2.2	2,184,852
1978-79	649,977	708,562	2,248,545	3,443,471	7,050,555	51	783		2.1	3,357,408
1979-80	140,228	332,583	1,462,059	4,057,847	5,992,717	49	561		2.0	2,996,359
1980-81	152,196	812,352	1,561,207	250,076	2,775,831	30	304		2.1	1,321,824
1981-82	351,139	722,834	1,503,253	288,425	2,865,651	29	216		--	-----
1982-83	471,422	31,447	921,663	45,308	1,469,840	40	304		2.1	699,924
1984 (2)	Closed	Closed	Closed	No Effort	0	0	0	--	--	-----
1985	Closed	Closed	No Effort	No Effort	0	0	0	--	--	-----
1986	137,720	236,241	160,829	587	535,377	14	35	26	2.1	254,941
1987	152,834	222,052	196,246	0	571,132	23	65	51	2.1	271,968
1988	55,929	226,509	191,654	0	474,092	21	46	34	2.1	225,758
1989	Closed	Closed	Closed	Closed	0	0	0	--	--	-----
1990	Closed	Closed	Closed	Closed	0	0	0	--	--	-----
1991	Closed	Closed	Closed	Closed	0	0	0	--	--	-----
1992	Closed	Closed	Closed	Closed	0	0	0	--	--	-----
1993	Closed	Closed	Closed	Closed	0	0	0	--	--	-----

(1) New districts established and first season of the minimum legal size.

(2) Calendar year season established.

Appendix B. King crab catch in pounds, Prince William Sound Management Area, 1960 - 1994

Year/Season	Total Pounds all specie
1960	246,965
1961	236,081
1962	31,478
1963	43,569
1964	14,028
1965	5,500
1966	11,000
1967	41,800
1968	200,000
1969	48,100
1970	94,300
1971	144,200
1972	296,200
1973	207,916
1974	85,379
1975	53,423
1976-77	17,087
1977-78	86,595
1978-79	114,000

	S P E C I E S			Avg. Wt.	Total		
Seasons	Red	Blue	Brown	Brown	Pounds	Vessels	Landings
1979-80	52,026	13,662	0		65,688	18	109
1980-81	32,433	7,282	20		39,735	14	65
1981-82	25,358	5,634	0		30,992	11	43
1982-83	30,809	10,433	147,016	9.7	188,258	31	187
1983-84	16,467	5,324	50,535	8.8	73,226	18	69
1984-85	235	closed	40,232	--	40,467	4	14
1985-86	closed	closed	51,800	5.8	51,800	4	11
1986-87	closed	closed	65,674	6.1	65,837	4	11
1987-88	closed	closed	68,270	6.6	68,270	4	15
1988-89	closed	closed	48,442	6.6	48,442	5	14
1989-90	closed	closed	closed	--	0	0	0
1990-91	closed	closed	*	--	*	*	*
1991-92	*	*	*	--	*	*	*
1992-93	closed	closed	closed	--	0	0	0
1993-94	closed	closed	closed	--	0	0	0

(*) Harvest data is confidential due to the limited number of participants.

Appendix C. Prince William Sound Area Dungeness crab catch, 1960 - 1993.

Year	Copper River Pounds	Lndgs.	Vessels	# Crab	Avg. Wt.	Percent Recruits	Orca Inlet Pounds	Vessels	Northern District Pounds	Lndgs.	Vessels	Total Pounds
1960	—	—	—	—	—	—	1,524,326	—	—	—	—	1,524,326
1961	—	—	—	—	—	—	990,242	—	—	—	—	990,242
1962	—	—	—	—	—	—	1,353,190	—	—	—	—	1,353,190
1963	—	—	—	—	—	—	1,216,846	—	—	—	—	1,216,846
1964	—	—	—	—	—	—	1,290,929	—	—	—	—	1,290,929
1965	—	—	—	—	—	—	1,240,372	—	—	—	—	1,240,372
1966	—	—	—	—	—	—	999,341	—	—	—	—	999,341
1967	—	—	—	—	—	—	NO DATA AVAILABL	—	—	—	—	NO DATA AVAILABL
1968	—	—	—	—	—	—	579,279	—	—	—	—	579,279
1969	336,696	—	—	—	—	—	541,822	—	—	—	—	878,518
1970	78,223	—	—	—	—	—	660,411	—	—	—	—	738,634
1971	78,848	—	—	—	—	—	430,976	—	—	—	—	509,824
1972	437,865	—	—	—	—	—	286,808	—	—	—	—	724,673
1973	458,613	—	—	—	—	—	347,764	—	—	—	—	806,377
1974	290,149	—	—	—	—	—	269,015	—	—	—	—	559,164
1975	654,410	—	—	—	—	—	163,631	—	—	—	—	818,041
1976	254,933	—	4	—	—	—	35,399	3	—	—	—	290,332
1977	506,751	—	4	—	—	—	228,858	23	—	—	—	735,609
1978	1,319,451	—	12	—	—	—	648,439	34	49,571	—	17	2,053,461
1979	504,770	—	19	—	—	—	123,245	32	20,924	—	16	652,924
1980	659,667	—	10	—	—	—	CLOSED	—	31,152	—	5	690,819
1981	1,503,574	202	18	—	—	25	CLOSED	—	5,683	11	5	1,509,257
1982	757,911	139	16	332,417	2.2	26	CLOSED	—	4,221	4	2	762,182
1983	379,094	86	9	184,026	2.1	49	CLOSED	—	511	14	2	379,605
1984	826,778	88	10	413,394	2.0	92	CLOSED	—	150	2	2	826,938
1985	1,006,196	124	17	483,748	2.1	63	CLOSED	—	1,233	5	1	1,007,429
1986	1,090,477	105	16	531,940	2.1	58	CLOSED	—	0	—	—	1,090,477
1987	887,713	92	13	438,974	2.0	34	CLOSED	—	5,461	2	2	893,174
1988	602,969	48	8	298,569	2.0	52	CLOSED	—	0	—	—	602,969
1989	635,976	43	9	326,226	2.0	25	CLOSED	—	0	—	—	635,976
1990	397,913	63	17	196,266	2.0	36	CLOSED	—	0	—	—	397,913
1991	70,259	32	14	39,033	1.8	62	CLOSED	—	0	—	—	70,259
1992 (1)	*	*	1	*	*	*	CLOSED	—	0	—	—	*
1993	SEASON CLOSED											

Appendix D. Pot shrimp harvest, Prince William Sound Management Area, 1960 - 1993.

Year	Vessels	Landing	Spot	Coonstripe	Other	Total [1] Whole Wt.
1960						4,988
1961						---
1962						3,576
1963						1,101
1964						4,248
1965						4,356
1966						---
1967						749
1968						6,866
1969						5,146
1970						19,776
1971						13,073
1972						6,949
1973						6,370
1974						24,978
1975						4,150
1976						2,410
1977						7,516
1978	9	17	N/A	N/A	N/A	15,466
1979	17	98	N/A	N/A	N/A	52,208
1980	23	155	84,787	5,174	67	90,028
1981	51	509	153,017	20,055	465	173,537
1982	57	397	205,746	7,250	784	213,781
1983	71	646	198,719	14,119	583	213,420
1984	79	513	198,729	7,911	640	207,280
1985	78	528	271,928	3,919	860	276,707
1986	80	540	286,105	3,715	812	290,632
1987	86	498	265,707	3,795	151	269,653
1988	76	433	191,630	764	48	192,442
1989	33	69	28,884	431	0	29,315
1990	23	59	36,378	358	0	36,737
1991	15	45	17,302	278	0	17,580
1992	C L O S E D					
1993	C L O S E D					

[1] Catches converted from tail weight to whole weight using a conversion factor of 2.

Appendix E. Trawl shrimp harvest, Prince William Sound Management Area 1972 - 1993.

Year	Vessels	Pounds
1972		5,153
1973		4,243
1974		1,345
1975		26,961
1976		134,115
1977		170,757
1978	8	440,684
1979	4	634,518
1980	6	557,328
1981	4	70,560
1982	9	346,517

Year	Vessels	Landings	Pink	Sidestripes	Other	Deadloss	Total
1983	13	46	420,275	1,058	2,345	—	423,678
1984	14	55	1,292,643	8,842	1,155	—	1,302,640
1985	6	44	432,514	15,696	440	—	448,650
1986	3	44	218,156	27,701	13	—	245,870
1987	2	109	275	95,043	440	—	95,758
1988	4	99	497	111,898	52	—	112,447
1989	*	*	*	*	*	—	*
1990	4	89	3,348	105,795	15	18,303	127,461
1991	5	67	3,453	84,483	193	51,429	139,558
1992	5	70	651	196,467	28	49,097	246,243
1993	7	72	23	190,976	51	55,140	246,190

(*) Catch data is confidential due to the small number of participants.

Appendix F. Razor clam harvest in pounds, Prince William Sound Area, 1960 - 1993.

Year	COMMERCIAL Diggers	Pounds	NON - COMMERCIAL Diggers	Pounds
1960		433,930		
1961		261,628		
1962		208,698		
1963		86,340		
1964		39,275		
1965		86,477		
1966		27,063		
1967		98,446		
1968		72,806		
1969		26,887		
1970		27,909		
1971		37,972		
1972		30,326		
1973		30,318		
1974		29,747		
1975		15,443		
1976		1,516		
1977	11	2,160		
1978	54	29,865		
1979	26	12,904		
1980	21	5,881		
1981	7	28,970		
1982	12	15,275		
1983	41	124,835		
1984	41	168,426		
1985	25	60,274	37	4,930
1986	17	13,122	38	4,831
1987	12	40,954	83	6,225
1988	4	6,766	52	2,768
1989	No Effort	0	50	2,903
1990	"	0	50	2,641
1991	"	0	77	1,484
1992	"	0	92	2,403
1993	"	0	37	1,131

1. A permit is required to harvest razor clams from the Copper River Delta for personal use, sport, or subsistence.